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**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/023,109

Applicant(s)

NIELSEN ET AL.

Examiner

Lun-See Lao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7-9, 11-27 and 29-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9, 11-27, 29-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)** \_\_\_\_\_

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Introduction***

1. This action is in response to the amendment filed 01-08-2007. Claims 1-5,7-9,11-13, 16-26 and 30-46 have been amended and claims 6 , 10 and 28 have been canceled; and claims 51-54 have been added. Claims 1-5, 7-9, 11-27 and 29-54 are pending.

### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01-08-2007 has been entered.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

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described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claim limitation " A method of equalizing output signals from one or more microphones, the method comprising the steps of:

(a) applying a first predictable noise to a converter having a known transfer function to convert the first predictable noise to an audio output based on the transfer function of the converter, and applying the audio output to the microphone without adaptively modifying the audio output to convert the audio output to a first output noise;

applying a second predictable noise to a compensation filter for compensating for the known transfer function of the converter, the first and second predictable noises being synchronized in time by a synchronizer, the compensation filter outputting a second output noise based on the compensation;

explicitly identifying a transfer function of the microphone based on the corresponding first and second output noises;

based on a single selected function for the one or more microphones, determining a filtering function for each signal path the microphone such that the product of the transfer function and the filtering function is the single selected function; and

applying the filtering function for the microphone to an equalization filter for the microphone such that a transfer function between the microphone and the equalization filter for the microphone is substantially equal to the single selected function " was not supported in the further detail in the specification nor in any of the claim and the examiner carefully reads the figs 2a-2b and 3 and specification page 11 line 1 to page

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16 line 16. The specification does not teach that applying the filtering function for the microphone to an equalization filter for the microphone such that a transfer function between the microphone and the equalization filter for the microphone is substantially equal to the single selected function.

5. Claim 16 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim limitation " An apparatus for equalizing output signals from one or more microphones, the apparatus comprising:

a module for applying a first predictable noise to a converter having a known transfer function, the converter converting a first predictable noise to an audio output based on the transfer function of the converter,

a module for applying the audio output to the microphone without adaptively modifying the audio output, the microphone converting the audio output to a first output noise;

a module for applying a second predictable noise to a compensation filter for compensating for the transfer function of the converter, the second predictable noise being synchronized with the first predictable noise by a synchronizer, the compensation filter outputting a second output noise based on the compensation;

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a module for explicitly identifying a transfer function of the microphone based on the corresponding first and second output noises;

a module for determining, a filtering function for the microphone based on a single selected function for the one or more microphones such that the product of the transfer function of the microphone and the filtering function is the single selected function; and

a module for applying the filtering function for the microphone to an equalization filter for the microphone such that a transfer function between the microphone and the equalization filter for the microphone is substantially equal to the single selected

function" was not supported in the further detail in the specification nor in any of the

claim and the examiner carefully reads the figs 2a-2b and 3 and specification page 11

line 1 to page 16 line 16. The specification does not teach a module for applying the

filtering function for the microphone to an equalization filter for the microphone such that

a transfer function between the microphone and the equalization filter for the

microphone is substantially equal to the single selected function.

6. Claim 42 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim limitation " A method of providing sound signals to a user through a system including one or more microphones, the method comprising steps of:

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preparing a filtering function for, each of one or more microphones, including, for each of the one or more microphones, the steps of:

applying a first predictable noise to a converter having a known transfer function, the converter converting the first predictable noise to an audio output based on the transfer function of the converter; applying the audio output to the microphone without adaptively modifying the audio output, the microphone converting the audio output to a first output noise; and

applying a second predictable noise to a compensation filter for compensating for the transfer function of the converter, the first and second predictable noises being synchronized in time by a synchronizer, the compensation filter outputting a second output noise based on the compensation,

explicitly identifying a transfer function of the microphone based on the corresponding first and second output noises; and

determining, the filtering function the microphone based on a single selected function for the one or more than microphones such that the product of the transfer function of the microphone and the filtering function is the single selected function, and

applying the filtering function for the microphone to the corresponding transfer function an equalization filter for the microphone such that a transfer function between the microphone and the equalization filter for the microphone is substantially equal to the single selected function,

operating the system, including the step of: for each of the one or more microphones, transferring a sound signal through the microphone and the equalization

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filter for the microphone" was not supported in the further detail in the specification nor in any of the claim and the examiner carefully reads the figs 2a-2b and 3 and specification page 11 line 1 to page 16 line 16. The specification does not teach that applying the filtering function for the microphone to the corresponding transfer function an equalization filter for the microphone such that a transfer function between the microphone and the equalization filter for the microphone is substantially equal to the single selected function.

7. Claim 43 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim limitation "A sound system for one or more microphones for transmitting sound signals, comprising:

a converter having a known transfer function; a module for applying a first predictable noise to the converter, the converter converting the first predictable noise to an audio output-based on the transfer function of the converter; a module for applying the audio output to the microphone without adaptively modifying the audio output the microphone converting the audio output to a first output noise; a compensation filter for compensating for the transfer function of the converter;

a module for applying a second predictable noise to the compensation filter, including a synchronizer for synchronizing the first and second predictable noises in time, the



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compensation filter outputting a second output noise based on the compensation;  
an identification circuit for explicitly identifying a transfer function of the microphone based on the corresponding first and second output noises; and

a determination circuit for determining, filtering function for the microphone based on a single selected function for the one or more microphones such that the product of the transfer function of the microphone and the filtering function is the single selected function,

the filtering function being applied to an equalization filter for the microphone to generate the selected function, whereby the sound signals from the sound providing system are substantially equal with respect to phase or phase and magnitude such that a transfer function between the microphone and the equalization for the microphone is substantially equal to the single selected function " was not supported in the further detail in the specification nor in any of the claim and the examiner carefully reads the figs 2a-2b and 3 and specification page 11 line 1 to page 16 line 16. The specification does not teach that the filtering function being applied to an equalization filter for the microphone to generate the selected function, whereby the sound signals from the sound providing system are substantially equal with respect to phase or phase and magnitude such that a transfer function between the microphone and the equalization for the microphone is substantially equal to the single selected function.

8. Claims 51-54 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which

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was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim limitation " the one or more microphones comprises at least a first microphone and a second microphone, and wherein an output signal through the first microphone and the equalization filter for the first microphone is substantially equal to an output signal through the second microphone and the equalization filter for the second microphone with respect to phase or phase and magnitude " was not supported in the further detail in the specification nor in any of the claim and the examiner carefully reads the figs 2a-2b and 3 and specification page 11 line 1 to page 16 line 16. The specification does not teach that the equalization filter for the first microphone is substantially equal to an output signal through the second microphone and the equalization filter for the second microphone with respect to phase or phase and magnitude.

### ***Claim Objections***

9. Claim 39 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim 39 depends on claims 16, 36. See MPEP § 608.01(n). Accordingly, the claim 39 has not been further treated on the merits.

10. Claim 40 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim 40 depends on claims 16, 37. See MPEP § 608.01(n). Accordingly, the claim 40 has not been further treated on the merits.

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11. Claim 41 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim 39 depends on claims 16, 38. See MPEP § 608.01(n).

Accordingly, the claim 40 has not been further treated on the merits.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1-4, 7-9, 11, 14-19, 22-24, 26, 29-31 and 33-45, 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaughn (US PAT. 5,233,655) in view of Hamabe (US PAT. 5,426,703).

Consider claim 16 Vaughn teaches that an apparatus for equalizing output signals from one or more microphones (see fig.1), the apparatus comprising:

a module for applying a first predictable noise (44a white noise) to a converter having a known transfer function, the converter converting a first predictable noise to an audio output based on the transfer function of the converter,

a module for applying the audio output (40) to the signal without adaptively modifying the audio output, the signal converting the audio output to a first output noise;

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a module for applying a second predictable noise (44b, pink noise) to a compensation filter (26) for compensating for the transfer function of the converter, the second predictable noise (44b) being synchronized with the first predictable noise (44a) by a synchronizer (45, microprocessor controller, such as cpu), the compensation filter outputting a second output noise based on the compensation;

a module for explicitly identifying a transfer function (10) of the microphone (20a) based on the corresponding first and second output noises (44a, 44b);

a module for determining (23), a filtering function for the microphone based on a single selected function for the one or more microphones such that the product of the transfer function of the microphone and the filtering function is the single selected function; and

a module for applying the filtering function (27) for the microphone (20a) to an equalization filter (28 and see col. 5 lines 9-17) for the microphone such that a transfer function (24) between the microphone (20a) and the equalization filter (28) for the microphone is substantially equal to the single selected function (23 and see col.5 line 50-col. 6 line 50); But Vaughn does not explicitly teach a module for applying the audio output to the microphone, the microphone converting the audio output to a first output noise.

However, Hamabe teaches a module for applying the audio output to the microphone (se fig. 1b, 8a-8h), the microphone converting the audio output to a first output noise (26 white noise and see col. 5 line 31-col.6 line 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a microphone into each signal path and to include, into the apparatus of Vaughn, a module for applying a predictable noise to each signal path to generate the output noise. One of ordinary skill in the art would have been motivated to combine the teaching of Hamabe into Vaughn because this would have provided an active noise eliminating system which can correct and update the noise elimination transfer function for providing a more reliable noise elimination function without causing noise pressure divergence (Hamabe, col. 2, lines 10-16).

As to claim 1, this is the method claim corresponding to apparatus claim 16. See previous apparatus claim 16 for rejection.

Consider claim 43 Vaughn teaches sound system for one or more microphones for transmitting sound signals, comprising:

- a converter (see fig.1 (41b, speaker) having a known transfer function;
- a module for applying a first predictable noise (44a, white noise) to the converter, the converter converting the first predictable noise to an audio output based on the transfer function of the converter;
- a module for applying the audio output (40) to the microphone without adaptively modifying the audio output the microphone converting the audio output to a first output noise;
- a compensation filter (26) for compensating for the transfer function of the converter;
- a module for applying a second predictable noise (44b, pink noise) to the

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compensation filter, including a synchronizer (45, microprocessor controller, such as cpu) for synchronizing the first and second predictable noises (44a, 44b) in time, the compensation filter outputting a second output noise based on the compensation;

an identification circuit for explicitly identifying a transfer function (10) of the microphone (20a) based on the corresponding first and second output noises (44a,44b); and

a determination circuit (23) for determining, filtering function for the microphone (20a) based on a single selected function for the one or more microphones (20a) such that the product of the transfer function of the microphone and the filtering function is the single selected function,

the filtering function (27) being applied to an equalization filter (28 and see col. 5 lines 9-17) for the microphone to generate the selected function, whereby the sound signals from the sound providing system (10) are substantially equal with respect to phase or phase and magnitude such that a transfer function (24) between the microphone and the equalization for the microphone is substantially equal to the single selected function(23 and see col.5 line 50-col. 6 line 50); But Vaughn does not explicitly teach a module for applying the audio output to the microphone, the microphone converting the audio output to a first output noise.

However, Hamabe teaches a module for applying the audio output to the microphone (se fig. 1b, 8a-8h), the microphone converting the audio output to a first output noise (26 white noise and see col. 5 line 31-col.6 line 67).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a microphone into each signal path and to include, into the apparatus of Vaughn, a module for applying a predictable noise to each signal path to generate the output noise. One of ordinary skill in the art would have been motivated to combine the teaching of Hamabe into Vaughn because this would have provided an active noise eliminating system which can correct and update the noise elimination transfer function for providing a more reliable noise elimination function without causing noise pressure divergence (Hamabe, col. 2, lines 10-16).

As to claim 42, this is the method claim corresponding to system claim 43. See previous apparatus claim 43 for rejection.

Consider claims 17-18, Vaughn teaches an apparatus of the selected function is the transfer function (see fig.1, (23)) for one of one the microphones (20a and see col.7 line 1-col.8 line 35); and an apparatus of the selected function is a common factor (such as, switching), and wherein the filtering function (27) is determined such that the product of the transfer function of the microphone (20a) and the filtering function is the common factor (such as 150HZ and col.5 line 31-col.6 line 67).

As to claims 2-3, these are method claims of claims 17-18 and thus note the rejections of claims 17-18, respectively.

As to claims 44-45, these are system claims of claims 17-18 and thus note the rejections of claims 17-18, respectively.

Consider claim 19, Vaughn teaches an apparatus of the module for applying the filtering function comprises:

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a module for loading the filtering function (see fig.1 (27)) to the equalization filter (28 and see col. 5 line 9-17).

As to claim 4, it is the method claim corresponding to apparatus claim 19. See previous apparatus claim 19 for rejection.

Consider claim 22 Vaughn teaches the module for applying a first predictable noise comprises:

a module for applying a first predictable noise signal (see fig.1 (44a)) to the converter (40b), the converter converting the first predictable noise signal (44a) to a first predictable noise sample based on the transfer function of the converter,

the module for applying the audio output comprises, a module for acoustically providing the first predictable noise sample (44a) to the microphone (20a) with a propagation time delay inherently, the module for applying a second predictable noise (44b) comprises:

a module for providing a second predictable noise signal (44b) to the compensation filter (26), the first and second predictable noise signals (44a,44b) being synchronized in time by the synchronizer (45, microprocessor controller, such as cpu), the compensation filter (26) compensating the second predictable noise signal (44b) for the transfer function of the converter (40b) and outputting the second output noise (44b) based on the compensation (see col. 5 line 32-col. 6 line 67), but Vaughn does not explicitly teach the microphone converting the first predictable noise sample with the propagation time delay to the first output noise.



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However, Hamabe teaches the microphone (see fig.1b (8a-8h)) converting the first predictable noise sample (26 white noise) with the propagation time delay to the first output noise (see figs 7c-7d and see col. 16 line 6-col. 17 line 11)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a microphone into each signal path and to include, into the apparatus of Gardner, a module for applying a predictable noise to each signal path to generate the output noise. One of ordinary skill in the art would have been motivated to combine the teaching of Hamabe into Vaughn because this would have provided an active noise eliminating system which can correct and update the noise elimination transfer function for providing a more reliable noise elimination function without causing noise pressure divergence (Hamabe, col. 2, lines 10-16).

As to claim 7, it is the method claim corresponding to apparatus claim 22. See previous apparatus claim 22 for rejection.

Consider claim 23-24 Vaughn teaches that the first predictable noise signal is a first predictable digital noise signal (see fig.1 (44a)), and the second predictable noise signal is a second predictable digital noise signal (44b), and wherein the apparatus comprises:

noise generator for generating the first predictable digital noise signal(44a) and the second predictable digital noise signal (44b and see col. 5 line 32-col. 6 line 67) and the module for identifying comprises:

a module for delaying (see fig.1, 28 and fig.2) the second output noise (44b) by same amount (such as, time constants) of time as the propagation delay time (see col. 7 line

27-61); and

a module for processing (28) the first output noise and the delayed second output noise (44a,44b) to estimate the transfer function of the microphone (20a and see col. 5 line 32-col. 6 line 67).

As to claims 8-9, these are method claims of claims 23-24 and thus note the rejections of claims 23-24, respectively.

Consider claim 26 Hamabe teaches that the first converter includes a loud speaker (7a-7d and see col. 5 line 32-col. 6 line 67). Note discussion of claim 16 for a motivation to combine.

Consider claim 29 Hamabe teaches that the propagation delay time is selected to be integer multiple (see equation 1) of the first predictable noise sample (white noise and col. 5 line 32-col. 6 line 67); Note discussion of claim 16 for a motivation to combine.

As to claim 11, it is the method claim corresponding to apparatus claim 29. See previous apparatus claim 29 for rejection.

Consider claims 30-31 Vaughn teaches that apparatus of the first predictable digital noise signal (see fig.1, (44b)) and the second predictable digital noise signal comprises a white noise signal (44a and see col. 5 line 32-col. 6 line 67); and apparatus of each of the first predictable digital noise signal (44b) and the second predictable digital noise signal comprises a random noise signal (44a and see col. 5 line 32-col. 6 line 67).

As to claims 14-15, these are method claims of claims 29 -31 and thus note the rejections of claims 30 -31, respectively.

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Consider claims 36-38, note discussion of claim 16 with respect to the apparatus. Vaughn further teaches an apparatus is comprising a listening device / hearing aid (see col. 6 lines 18-29) / headset (see fig.1 (40b)) comprising: one or more microphone (see fig.1, 20a) for transmitting sound signals to a user, outputs from the one or more microphones (20a) being equalized (see fig. 1 (28)) and col. 5 line 35-col. 6 line 67) by the apparatus (see rejection of claim 16).

As to claims 33-35, these are method claims of claims 36-38 and thus note the rejections of claims 36-38, respectively.

Consider claims 39-41, Vaughn teaches a hearing aid (a listening device and a headset and see col. 5 line 50-col. 6 line 29)) comprising:

a signal equalization filter (see fig.1, (28) and col.5 lines 9-17) provided for each of one or more microphones (20a), wherein the function of the signal equalization filter is determined by the signal equalization filter (see fig. 1 (28) and col. 5 line 35-col. 6 line 67).

Consider claims 51-54 Vaughn teaches that the one or more microphones (see fig.1 (20a)) comprises at least a first microphone and a second microphone (20a), and wherein an output signal through the first microphone and the equalization filter (28) for the first microphone (20a) is substantially equal (possibly by adjust 24 program gain amplifier) to an output signal through the second microphone (20a) and the equalization filter (28 and see col. 5 lines 9-17) for the second microphone (20a) with respect to phase or phase and magnitude (44a and see col. 5 line 32-col. 6 line 67).

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14. Claims 5,12-13, 20-21, 25, 27, 32 and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaughn (US PAT. 5,233,665) as modified by Hamabe (US PAT. 5,426,703) as applied to claims 16 and 43 above, and further in view of T. Schneider, DG. Jamieson, " A Dual channel MLS-Based Test system for Hearing-Aid Characterization", J audio Eng. Soc, Vol 41, No.7/8, 1993 July/August, P583-593.

Consider claim 20 Vaughn teaches that an apparatus of the module for applying a first predictable noise comprises (44a white noise) a noise generator (44a) for generating a first predictable noise (44a) sample signal noise and providing generating a second predictable noise sample signal (44b, pink noise), the second predictable noise (44b) sample signal having a property substantially identical to the first predictable noise sample signal (44a) and being substantially identical to the first predictable noise sample signal (44a) on a sample-by-sample basis, the converter (such as 40b , speaker) converting the first predictable noise sample signal (44a) to the audio noise output, the first and second predictable noise sample signals (44a, 44b) being synchronized in time by the synchronizer (45, microprocessor controller, such as cpu), the compensation filter (26) compensating the second predictable noise sample signal (44b) for the transfer function of the converter and outputting the second output noise based on the compensation (see col.5 line 31-col.6 line 67); but Vaughn does not explicitly teaches that the predictable noise sample signals are on a sample-by-sample.

However, Schneider teaches that the predictable noise sample signals are on a sample-by-sample (see page 584 left column line 37- right column line 20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Schneider into the teaching of Vaughn and Hamabe to reduce the noise and to provide a sound environment for the purpose of acquiring the desired audio sound quality.

As to claim 5, it is the method claim corresponding to apparatus claim 20. See previous apparatus claim 20 for rejection.

As to claim 46, it is a sound system claim corresponding to apparatus claim 20. See previous apparatus claim 20 for rejection.

Consider claim 21, Hamabe teaches that the microphone is capable of converting a sound signal to an electrical analog signal, and wherein the apparatus comprises an analog-to-digital converter coupled to the microphone for converting the electrical analog signal into a digital signal (see fig.1b, (15a-15h) (see col. 5 line 32-col. 6 line 67). Note discussion of claim 16 for a motivation to combine.

Consider claim 25 Vaughn and Hamabe does not teach the an apparatus of the noise generator includes a maximum length sequence generator for generating the first predictable digital noise signal that is substantially identical to the second predictable digital noise signal on a sample-by-sample basis.

However, Schneider teaches that an apparatus (see fig.3) of the noise generator includes a maximum length sequence generator for generating the first predictable digital noise signal that is substantially identical to the second predictable digital noise signal on a sample-by-sample basis (it is inherently the MLS generator generated the

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predictable digital noise signal samples are identical in the same amount of time intense of the maximum length and see pages 583-590).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Schneider into the teaching of Vaughn and Hamabe to reduce the noise and to provide a sound environment for the purpose of acquiring the desired audio sound quality.

Consider claims 27, 32 they are essentially similar to claim 25 and are rejected for the reason stated above apropos to claim 25.

As to claims 12-13, these are method claims of claims 25 and 27 and thus note the rejections of claims 25 and 27, respectively.

As to claims 47-48, these are sound system claims of claims 25, 27 and thus note the rejections of claims 25, 27, respectively.

15. Claims 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaughn (US PAT. 5,233,665) as modified by Hamabe (US PAT. 5,426,703) as applied to claims 16 and 43 above, and further in view of Roberts, R. A. et al., "Digital Signal Processing," ISBN 0-201-16350-0, pp. 486-489.

Consider claims 49-50, Gardner teaches module for identifying a transfer function performs (see fig.3, (42,44) and col.2 lines 7-22 and col.7 lines 1-60); Gardner fails to teach that the transfer function performs an Auto Regressive Moving Average (ARMA) to estimate the transfer function.

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However, Roberts teaches that a transfer function performs an Auto Regressive Moving Average (ARMA) to estimate the transfer function (see "Digital Signal Processing," ISBN 0-201-16350-0, pp. 486-487).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Roberts into the teaching of Gardner and Hamabe to provide a sound environment for the purpose of acquiring the desired audio sound quality for the market demand.

### ***Response to Arguments***

16. Applicant's arguments with respect to claim 1-5 and 7-50 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Parkins (US PAT. 6,665,410) is cited to show other listening device.

18. Any response to this action should be mailed to:

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao, Lun-See whose telephone number is (571) 272-7501. The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao, Lun-See *LS*  
Patent Examiner  
US Patent and Trademark Office  
Knox  
571-272-7501  
Date 03-21-2007

  
VIVIAN CHIN  
SUPERVISOR/PATENT EXAMINER  
TECHNOLOGY CENTER 2600